FLIGHT
The AIRCRAFT ENGINEER & AIRSHIPS

First Aero Weekly in the World
Founder and Editor: STANLEY SPOONER
A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport
OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 831. (No. 48, Vol. XVI.) NOVEMBER 27, 1924 [Weekly, Price 6d. Post free, 7d.

Flight

The Aircraft Engineer and Airships

Editorial Offices: 36, GREAT QUEEN STREET, KINGSWAY, W.C. 2.
Telegrams: Truditur, Westcent, London. Telephone: Gerrard 1828

Annual Subscription Rates, Post Free:
United Kingdom .. 30*s.* 4*d.* Abroad .. .. 33*s.* 0*d.**

These rates are subject to any alteration found necessary under abnormal conditions and to increases in postage rates

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EDITORIAL COMMENT.

THE world is full of surprises, even the aviation world. Doubtless, there are many who believe that if we have not reached anything like finality in aircraft design, we have, at any rate, come to the stage in development when further progress must necessarily be slow and chiefly in the nature of relatively small detail improvements. And for all that has been proved up to the present, that opinion may be correct. Some recent experiments carried out in Germany—in a totally different direction—may, however, ultimately prove to be the innovation, the radical change, which those who believe that we are unable to proceed much farther along the present lines have been hoping for. Herr Flettner's "rotor ship" has already made the shipping world "sit up and take notice," and if the rough estimates made by a correspondent, and published elsewhere in this issue of FLIGHT, are even very approximately correct, it may well be that before long the aviation world will be at least as interested. In fact, if the principles of Herr Flettner's invention are applicable to aviation, it would seem that the invention will mean even more to aviation than to shipping, for whereas in the case of the latter it can only mean an improvement, possibly a very great improvement, in the case of aviation it may mean the difference between a commercial proposition and—shall we say?—a subsidised monopoly company?

The Rotor and Aviation

Our correspondent, not being in possession of any "aerodynamical" data relating to the Flettner invention, has had to argue in a general way, and to some extent, therefore, the figures at which he arrives may easily be open to criticism. For all that, the speculations are of the very greatest interest, and it is difficult to see where any very great error can have been made. Our correspondent, who is, by the way, a well-known aircraft designer, has obtained the dimensions of the "rotor ship" from Lloyd's List, and starting with the total displacement of the "Buckau," he has estimated that the gross horse-power necessary to drive the ship at the speed claimed to have been attained would be somewhere in the

neighbourhood of 250 h.p. By making an allowance for 80 per cent. mechanical efficiency and 60 per cent. propeller efficiency, the actual horse-power delivered by the propeller becomes 120 h.p., corresponding to a thrust of approximately 4,600 lbs. at 8½ knots. This, therefore, is the resistance that has to be overcome to give the vessel that speed. So far, there does not appear to have been much room for going wildly astray, even if the figures are only approximately correct. Before it becomes possible to estimate what forces on the towers this represents, it has been necessary to assume a size. It has been stated that the towers are 60 ft. high and 10 ft. in diameter. Judging from photographs that have been published, these dimensions seem roughly correct.

Our correspondent then takes 60 ft. by 10 ft. as being correct, and so obtains a loading on the towers or rotors of 3·8 lbs./sq. ft. This figure, considering the relatively very low air speed, is little short of astonishing. Taking as a rough-and-ready drag coefficient for a cylinder the figure 0·55, the force on the cylinders, if not rotating, would only be about one-fortieth of this. Thus, if the estimates are anywhere near correct, the result of rotating the towers is to increase the air forces on them 40 times. If the rotors follow the usual V^2 laws, the force on them at 30 m.p.h. would thus be 95·8 lbs./sq. ft., so that a cylinder 10 ft. in length and 1 ft. in diameter would lift 958 lbs., or rather more than the weight of the majority of the light 'planes at Lympne!

There are many questions yet to be probed, certainly, but the results that *appear* to be obtainable are such that it seems extremely worth while to carry out experiments at once. It is fairly obvious that wind-tunnel tests would be called for in order to determine the effect of various ratios of rotational to translational speed, as this could not easily be done with actual aeroplanes, but as already facilities exist at the N.P.L. for testing complete scale models of aeroplanes with airscrews revolving, the problem should not be a difficult one. If these tests should give results tallying reasonably well with those obtained with the "rotor ship," the next step might very well be the actual flight-testing of the invention with light 'planes. Thus the total cost of the experiments should be by no means prohibitive, especially in view of the results that seem at the moment to be possible.

It will be realised that although the rotors appear to give very extraordinary results as regards "lift," we have no information whatever relating to drag. It may very well be that the resistance to forward motion would be such as to nullify any advantage which the extra lift would give. That the L/D ratio of the rotors would be anything like as high as that of ordinary aerofoils seems very doubtful, but even if the best ratio obtainable were no more than 3 to 1, or even 2 to 1, the results would be astounding. For instance, just by way of an example, suppose the best L/D ratio of the rotor were 3 to 1, and that the "lift" indicated by our correspondent's estimates be correct, then the drag on the rotors of a 1,000 lb. machine at 6 m.p.h. would be 1,000 : 3 = 333 lbs., corresponding to a power of 5·34 h.p. required to overcome "wing" drag. Even with an L/D ratio of 1 the horse-power required for the rotors of the 1,000 lb. machine would be but 16 h.p.

The problems and possibilities opened up by this new invention are so fascinating that they cannot fail to attract the very greatest attention, and from the few examples quoted above it will be seen that, even if our correspondent's estimates are very much "out," and the results attainable are only one-half or one-quarter of those indicated, further research into the problem would be very well justified.

We shall welcome contributions on the subject, and would ask aircraft designers and others interested to send us their views.

THE DUTCH FLIGHT TO JAVA: The Fokker F. VII Commercial Monoplane, fitted with a Rolls-Royce "Eagle IX" engine on which Mynheer van der Hoop (insert left), and Lieut. van Weerden Poelman, with engineer van den Broeke, have just completed a flight from Amsterdam to Batavia (Java) in the Dutch East Indies.

FLIGHT

THE FLETTNER "ROTOR SHIP"

Is the Principle Applicable to Aircraft?

VERY considerable interest has been aroused in shipping circles by the recent accounts of the trial runs of the new German mystery ship which "sails without sails." The principles involved do not appear to be at all clearly realised, and the consequence has somewhat naturally been that extravagant surmises and claims have been put forward; nor is this at all surprising. The differences between the sailing ship and the "rotor ship" are indeed such as to perplex anyone with a knowledge of the old sailing ships and their ways, and even the naval architect may be expected to be "floored" for the minute by the paradoxical behaviour of the "rotor ship," which has no sails yet is propelled by the wind, which has engines, but such small engines as to be totally incapable of propelling the ship at the speeds attained.

The "Rotor Ship" is the invention of a German engineer, Herr Anton Flettner, of Berlin-Schöneberg, who is, perhaps, better known for his inventions relating to rudders for ships and aircraft. Herr Flettner has patented a number of arrangements for reducing the amount of force which has to be exerted by the air pilot, or, in the case of a vessel, by the helmsman. Briefly, the Flettner systems, however much they may differ in detail, consist in utilising a small rudder, requiring but small forces to operate it, for operating the main rudder. In other words the pilot works the rudder in an indirect instead of in a direct manner. Whether the "rotor ship" is the outcome of Herr Flettner's research work on rudders we naturally cannot say. On the face of it there does not appear to be any obvious connection between the two, but the probability is that one is the outcome of work in connection with the other. In outward appearance the Flettner "rotor ship" is an ordinary hull, fitted with two towers having the form of cylinders, one placed forward and the other aft, approximately in the positions that would normally be occupied by the two masts. No very reliable data are available, but such illustrations as have been published appear to indicate that the towers are approximately 60 ft. high and probably 10 ft. or so in diameter. The towers are said to be revolved by two small electric motors of about 9 h.p. each, and the speed attained is believed to have been 8½ knots. Now it is perfectly obvious that a vessel of the size of the "Buckau" would not attain anything like this speed, powered with engines of 18 h.p. only. The overall length of the vessel is 155·8 ft., the beam 29·5 ft., and the depth 14 ft. The probable draft is 12 ft., and the total displacement 1,000 tons.

In a chatty letter to us on the subject of the "rotor ship," a correspondent makes the suggestion that the principle upon which Herr Flettner works may be exactly the same as that which causes a spinning golf ball, for example, to follow a different trajectory from that of a non-rotating one. "If one desires," our correspondent's letter runs, "to make the ball strike the ground almost vertically so as not to roll unduly, one slices it underneath, I understand (not being a golf fiend), and the result is somewhat as shown in the upper diagram."

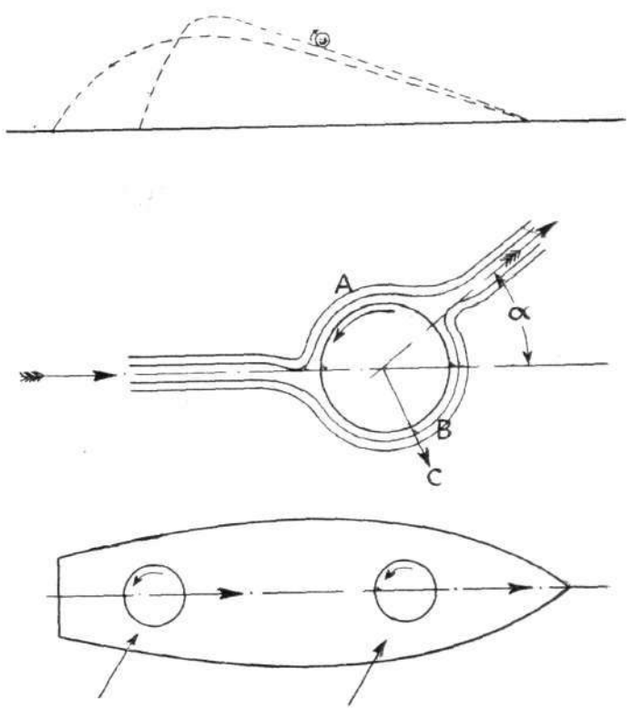
In the diagram the lower curve represents the trajectory of a non-spinning ball, while the upper curve shows roughly the path followed by a sliced ball which rotates in the direction shown by the arrow. To show how effective the rotors of the "Buckau" must be, our correspondent estimates that she would require 250 h.p. to develop the speed of 8·5 knots, which the Germans claim to have accomplished in a wind—approximately athwartships—of 4 *to* 5 *knots*. Assuming a mechanical efficiency of 80 per cent., and a propeller efficiency of 60 per cent., the horse-power available for actual propulsion would be 120 h.p., and the thrust would be roughly 4,600 lbs. at 8·5 knots. Our correspondent's letter then goes on as follows: "It has been stated that the towers are 60 ft. high and 10 ft. in diameter, giving 1,200 sq. ft. of projected area for the two. This gives a *minimum* loading (that is assuming the resultant thrust to lie dead ahead) of 3·8 lbs./sq. ft. It is astonishing to note that the loading (*i.e.*, drag on the cylinders if stationary) in the same wind would be only some $\frac{1}{40}$*th of this*. [This figure is arrived at on the assumption that the drag coefficient k_D for smooth cylinders has a value of 0·55 on the projected area.—ED.]

"The force seems to be generated by a circulation round the cylinders exactly as in the case of an aerofoil, only with the rotors the circulation is artificially produced. Doubtless the same laws regarding changes of aspect ratio also apply, and there is probably a definite peripheral speed for the rotors to suit any particular wind velocity.

"It is possible that the towers are fitted with longitudinal external vanes to accentuate the circulation effect, and in this connection it is interesting to note that the modern golf ball is 'pock-marked' in a particular manner dictated by long experience. [An examination of photographs of the "rotor ship" does not indicate any external vanes.—ED.]

"The towers appear to be pure cantilever structures and probably have an internal fixed mast carrying bearings with the rotors revolving outside it. The object of using two towers is probably to obtain balancing components acting along the ship in case of unfavourable winds. For example, should the wind be directly astern, the towers would be run in opposite directions.

"The way the thing works is, I think, something like the attached sketch (*see* central diagram), the wind being



Above: Trajectories of spinning and non-spinning golf ball. In centre, diagram showing action of rotors, and below, plan of "rotor ship."

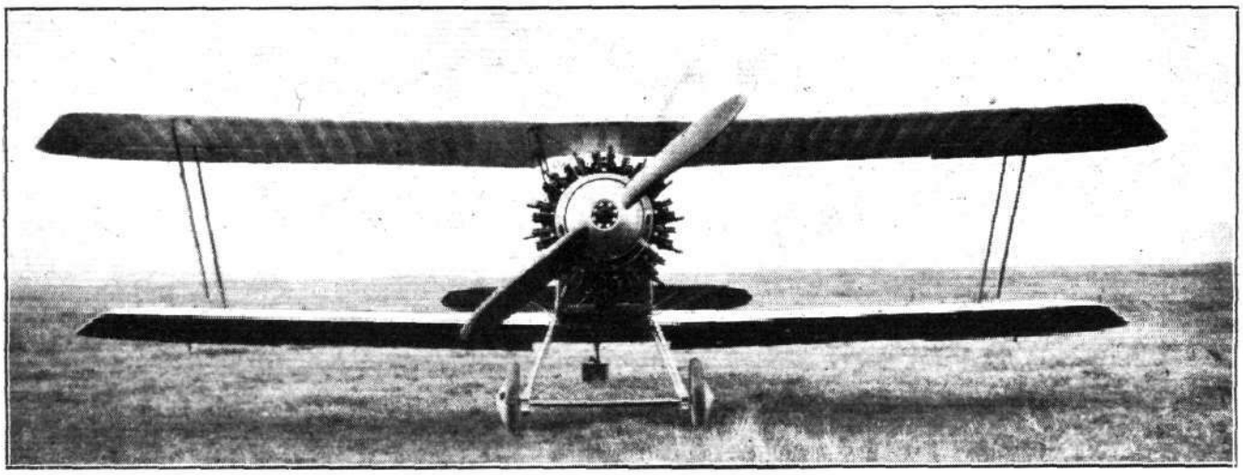
deflected through an angle α, owing to the rotation of the cylinder. There would be a zone of pressure round 'A,' as on the underside of an aerofoil, and a zone of negative pressure at 'B,' a force being produced in the direction of the arrow 'C.' If the direction of 'C' should coincide with the line of motion of the ship the best results would naturally be obtained. It seems obvious that angle α could be varied by changing the ratio of rotor speed to wind speed.

"The question now is: 'Can the principle be applied to aeroplanes?' We want a lot of data before one can express an opinion that would be worth much, but it seems quite possible that the whole thing will open up an entirely new line of thought. It might be possible to use terrific 'wing' loadings and yet retain a low landing speed. It is doubtful whether the actual efficiencies in terms of lift/drag would be better, but this would not matter much if very high lift could be obtained. The aeroplane has never been capable of carrying weight per horse-power in any way comparable with other forms of transport. I submit, therefore, that if this scheme will allow us to carry, say, 1 cwt. per horse-power, even if the speed were only 50 m.p.h., the future of the heavier-than-air 'bus is settled for all purposes! It could compete with the Foden for haulage purposes! The rotors would have to be driven by the forward speed of the machine, if possible, as otherwise all lift would go if the engine 'conked.' I believe that if the scheme is found to be of practical use for ships, the next step would be to employ the rotors as wings for aeroplanes, or, what is perhaps as likely, as a sort of helicopter."

THE MARTINSYDE A.D.C. I SINGLE-SEATER FIGHTER

380 H.P. Armstrong-Siddeley "Jaguar" Engine

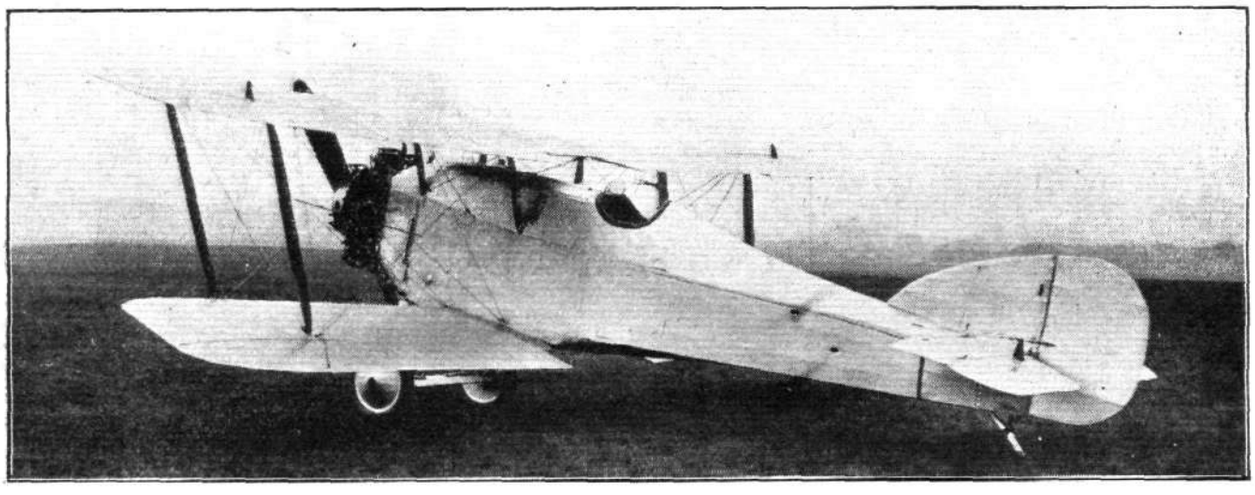
SOME months ago, it may be remembered, we announced that the stores, stocks, and goodwill of the Martinsyde Co., of Woking, had been taken over by the Aircraft Disposal Co., and that, in consequence, it might be expected that when the firm made a start with original designs, these would follow somewhat on the lines of the famous Martinsyde machines, or that, at any rate, the "Tinsides" would form a basis on which to commence to develop Aircraft Disposal Co. types. Some time ago the services of Mr. John Kenworthy, as chief designer, were secured by the A.D.C., and the first result of this collaboration has now materialised in the form of a single-seater fighter with Armstrong-Siddeley "Jaguar" engine. The new machine will be known as the Martinsyde A.D.C. I, and, although its initial tests have not yet been completed, there is justification for stating that the performance is extremely good and that the "Disposalsyde," as a wag has nicknamed it, would be a very useful addition to the fighting equipment of any country.



THE MARTINSYDE A.D.C. I: Front view. The engine is an Armstrong-Siddeley "Jaguar."

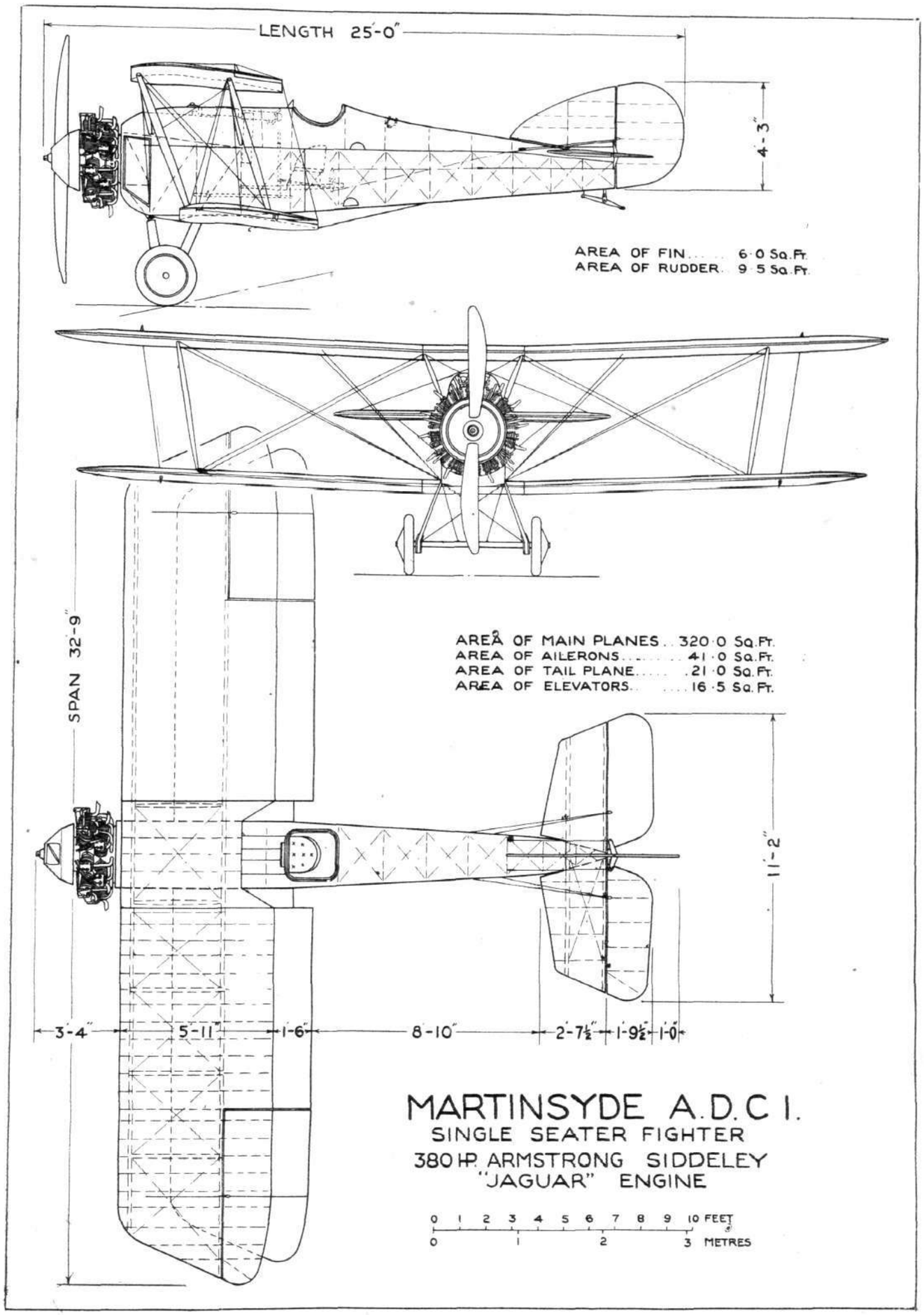
True to the original intentions of the Aircraft Disposal Co., the Martinsyde A.D.C. I has retained some of the features of the familiar Martinsyde F.4. Thus, the rear portion of the fuselage is identical with that of the F.4, and the same applies to the main planes. At present the undercarriage is also of normal type, but it is likely that on subsequent machines this may be replaced by an oleo undercarriage. The whole front portion of the fuselage has been re-designed, not only on account of the installation of a different engine, but also for reasons connected with petrol tank position, machine-gun installation, etc. The result has certainly been the production of an extremely business-like looking machine, and when we state that the top speed is already somewhat over 160 miles per hour, and the average climb to 10,000 ft. accomplished in about 4 m. 50 s., it will be realised that the performance bears out the impression given by the lines of the machine. It might be added that these figures are not necessarily final, as some testing and experimenting with various propellers is still to be carried out, but even as they stand the figures are extremely good. We have no figures relating to the landing speed, but the impression gained while watching the machine flying is that the landing speed is very low. Mr. Kenworthy informs us that according to performance estimates the machine should land at somewhat less than 50 miles per hour, so that a speed range of 50 to 160 miles per hour must be regarded as distinctly good.

The general lines and lay-out of the Martinsyde A.D.C. I will be clear from the accompanying photographs and scale drawings. The machine is a normal staggered tractor biplane, with the pilot's cockpit so placed in relation to the wings as to give a good view in all directions. The fuselage is, as regards its rear portion, a spruce girder braced by tie-rods, while the front portion has ply-wood covered sides. The pilot's "office" is provided with a particularly complete set of instruments, and the two Vickers' machine-guns are conveniently placed, and are, needless to say, fitted with Constantinesco gun gear. Two sliding doors in the deck fairing, ahead of the wind-screen, give access to the gun mechanism, as indicated in a sketch, and the high deck fairing with its straight tumble-home sides affords ample room for mounting the guns without crowding. Steel guards are fitted between the guns and the top of the petrol tank.

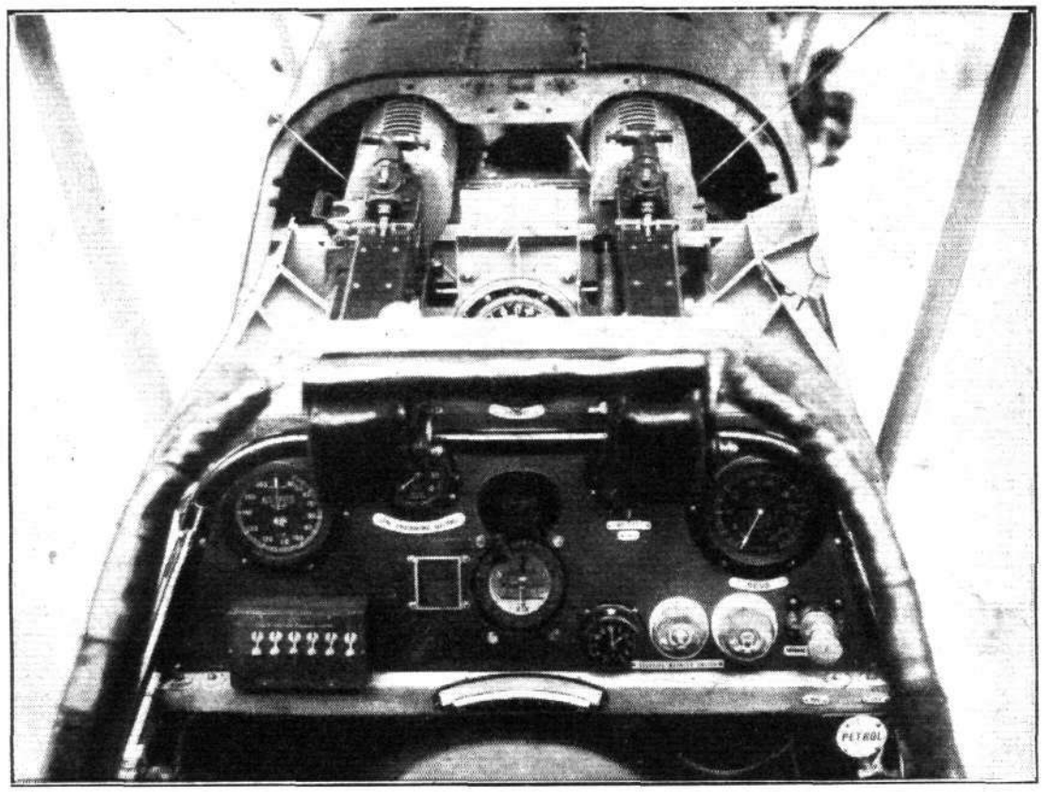


THE MARTINSYDE A.D.C. I: Three-quarter rear view.

A particularly neat mounting has been designed for the

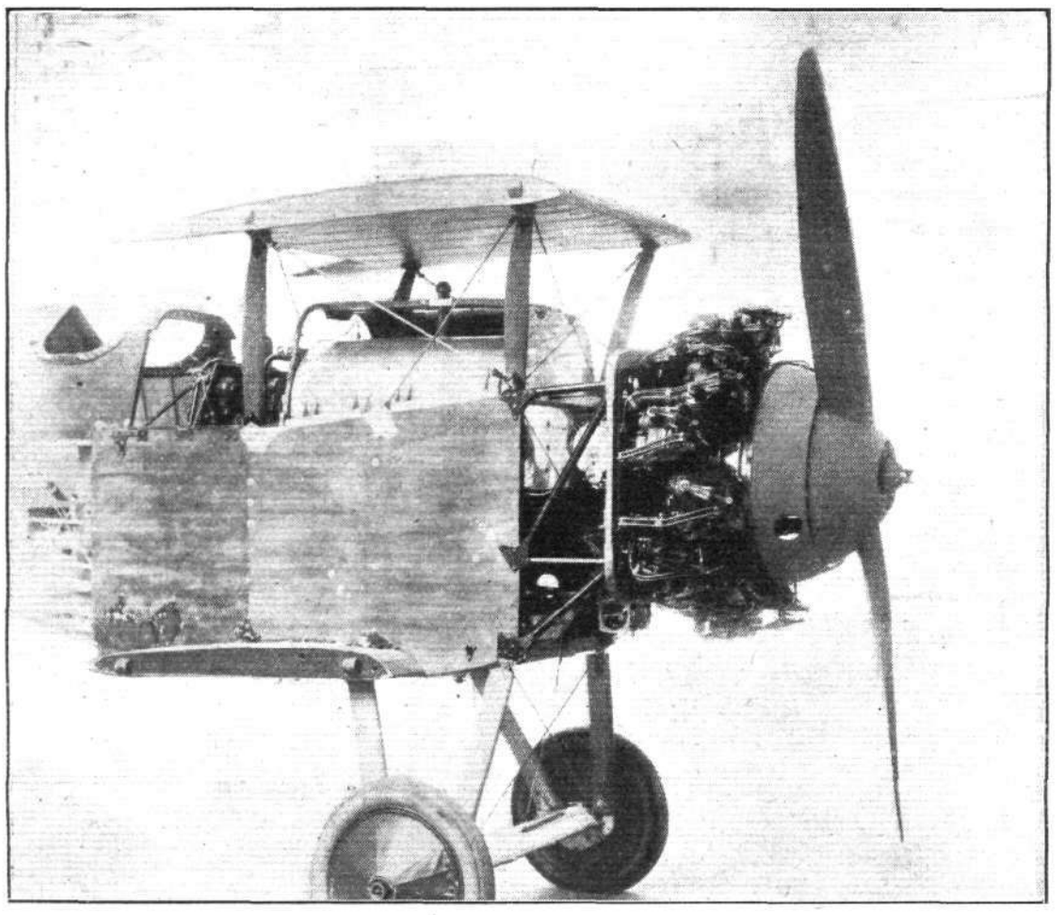


THE MARTINSYDE A.D.C. I : General arrangement drawings, to scale. The engine is an Armstrong-Siddeley "Jaguar."



The Martinsyde A.D.C. I: View from above showing cockpit, guns, etc.

Armstrong-Siddeley "Jaguar." This is in the form of a tubular structure of simple design, attached at the back to the fireproof bulkhead and in front to a pressed-steel engine frame. The usual "Jaguar" cupped steel support has been retained, and to this is bolted the pressed-steel frame. For dismantling the engine it is only necessary to undo the four



The Martinsyde A.D.C. I: View of engine mounting, etc. This photograph was taken before covering.

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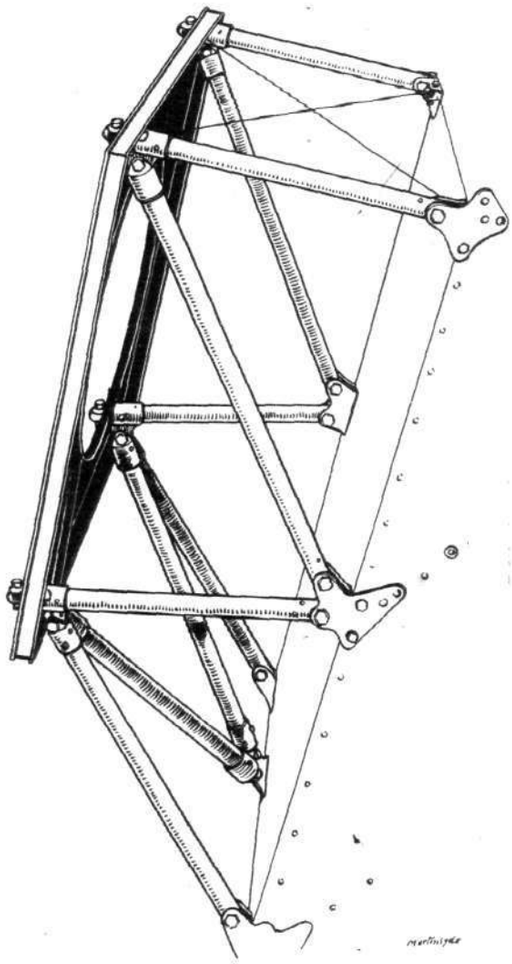
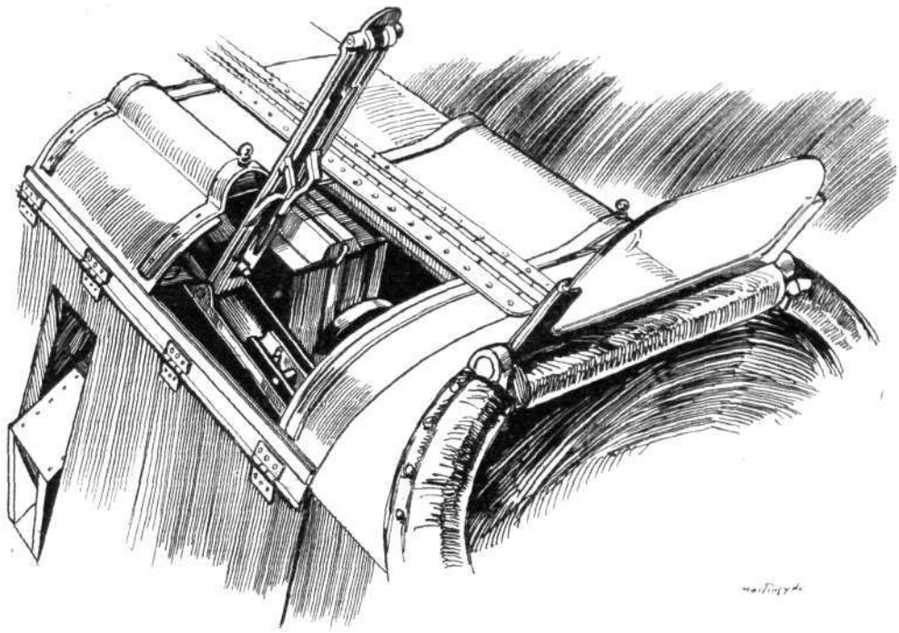
AIRCRAFT ENGINEER

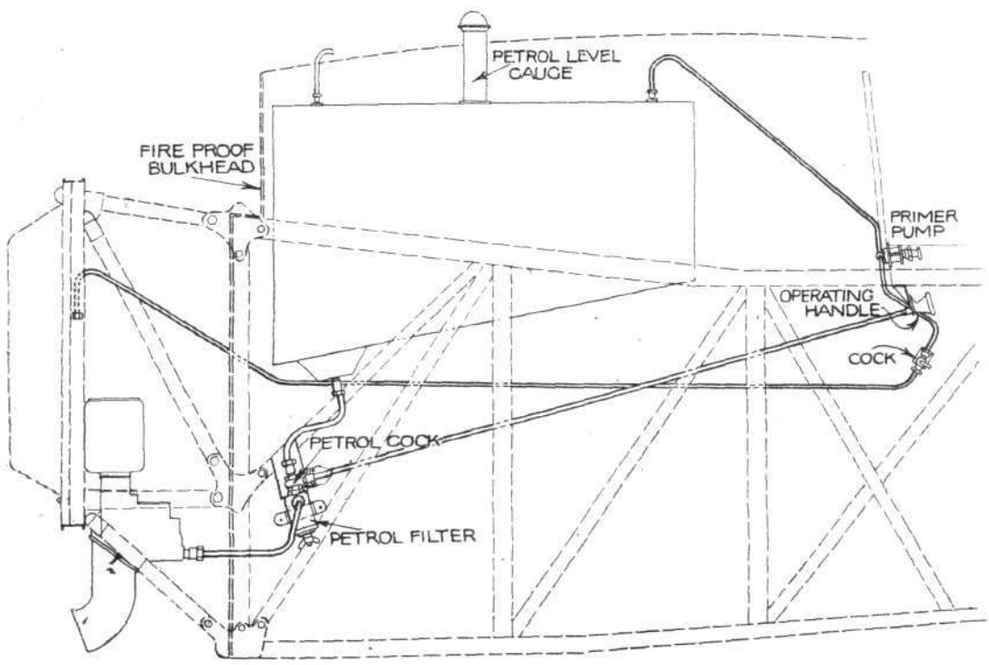
corner bolts, and, of course, the various engine and fuel connections, and the whole engine can be lifted out complete with its plate. The fireproof bulkhead is built up of two outer layers of aluminium sandwiched in between which is an asbestos sheet. The various engine controls, etc., are taken through the bulkhead in long sleeves, so that there is no risk of any fire in the engine compartment getting past the bulkhead.

Direct gravity feed is provided, the petrol tank, which has a capacity of 55 gallons, being mounted under the deck fairing, immediately aft of the fireproof bulkhead. From the diagram of the petrol system it will be seen that with the shape of tank adopted, and the placing so close to the engine, there will be a considerable "head" of petrol even when the machine is climbing at a very steep angle. For starting, a second petrol pipe with primer pump and cock in the cockpit are provided, and when we visited Waddon last week to see the machine fly the engine started up with remarkable ease. The petrol tank is provided with a level gauge marked with large figures which can be easily read from the cockpit. The capacity of 55 gallons is sufficient for slightly more than two hours at full throttle, so that the range of the machine may be said to be at least 300 miles. All engine controls, as





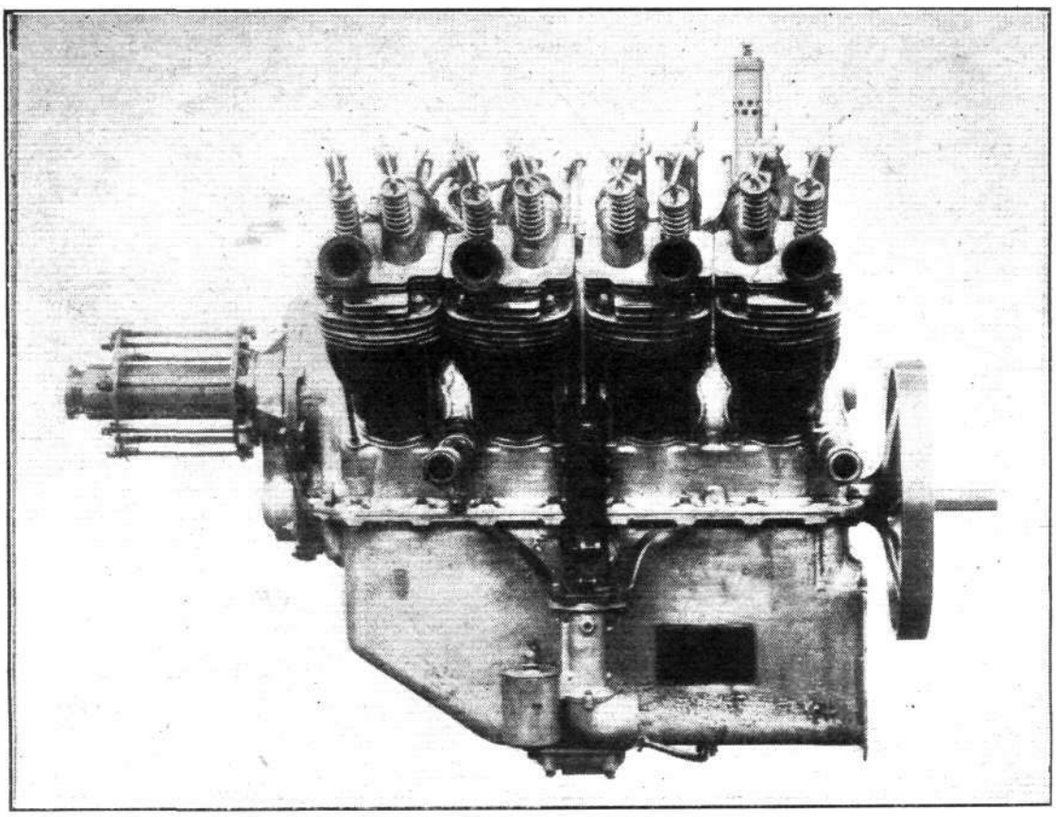
Left : Perspective sketch of the tubular engine mounting of the Martinsyde A.D.C. I : The "Jaguar" engine can be removed from the machine by undoing the four corner bolts. Right : The machine-guns on the Martinsyde A.D.C. I are very accessible. This sketch shows how the two sliding doors on the deck fairing allow of getting at the gun mechanism. The port chute for the empty cartridges can also be seen.



The simple gravity petrol system of the Martinsyde A.D.C. I. The upper pipe is for priming, and conducts petrol to the induction system of the engine.

already stated, pass through long guides or leads in the fireproof bulkhead so as to reduce fire risk. The engine controls are operated by push-and-pull rods, and an interlocking arrangement is provided whereby the altitude control is automatically shut when the throttle is closed.

The oil tank, which has a capacity of 4½ gallons, is mounted below the floor of the fuselage, and by a special system of baffles inside the tank, the hot oil is made to circulate forward and backward over the bottom of the tank, which, being exposed to the air, serves to cool the oil. A thermometer is fitted in the oil tank, with an indicator dial in the cockpit. All petrol and oil pipes are of large bore, and are fitted with the R.A.E. metallic coupling in place of the usual rubber tube joints. A spinner over the propeller boss, faired by a ring of aluminium, fixed to the engine, streamlines the forward portion of the "Jaguar" engine, leaving just sufficient of the cylinder heads exposed to ensure adequate cooling. The main dimensions of the Martinsyde A.D.C. I are given on the general arrangement drawings on p. 743. The item weights are as follow:—Engine, 780 lbs. (355 kgs.); propeller and spinner, 41 lbs. (18·6 kgs.); engine cowling and fireproof bulkhead, 30 lbs. (13·6 kgs.); instruments and fittings, 20 lbs. (9·1 kgs.); fabric covering of wings, fuselage and tail units, 62 lbs. (28·2 kgs.); tanks, pipes and filters, 85 lbs. (38·6 kgs.); aeroplane structure, 850 lbs. (386 kgs.); fuel, 390 lbs. (177 kgs.); oil, 42 lbs. (19·1 kgs.); pilot, 170 lbs. (77 kgs.); two Vickers' machine-guns, 66 lbs. (30 kgs.); ammunition (1,200 rounds 0·303) 86 lbs. (39 kgs.); oxygen apparatus, 28 lbs. (12·7 kgs.). Total loaded weight, 2,650 lbs. (1,200 kgs.). Power loading (on 380 h.p.), 7 lbs./h.p. (3·17 kgs./h.p.). Wing loading, 8·28 lbs./sq. ft. (40.5 kgs./sq. m.).



The new 120 h.p. A.D.C. Renault engine, which has been developed by the Aircraft Disposal Co. Maj. F. B. Halford, who was largely responsible for the original B.H.P. engine, has carried out the design work in connection with the modifications to the Renault.

Sir Sefton Brancker's Flight to India

OUR energetic Director of Civil Aviation, Air Vice-Marshal Sir Sefton Brancker, on November 20, started on his aerial tour to India, which we outlined in last week's issue of FLIGHT. The D.H.50 machine, piloted by Alan Cobham, left Stag Lane Aerodrome at 1 p.m. for Paris on the first stage of the journey. We need not repeat the details of this tour here, but, briefly stated, the object of the tour is to enable Sir Sefton to make a personal survey of the route of the proposed Imperial airship service to India, including the establishment of aeroplane "feeder services" *en route*, and to investigate the possibilities of further extensions of the existing air services.

After leaving England Sir Sefton was obliged to land at Poix, at 3.30 p.m., owing to fog, but the following morning the flight was resumed to Paris. The next day they flew on to Cologne, where they spent the night, continuing the following day to Berlin, arriving at the Staaken aerodrome at 12.50 p.m. While in Berlin Sir Sefton took the opportunity of conferring with the German authorities on many important air matters.

Amsterdam-Batavia Flight

THE Dutch flight from Amsterdam to Batavia, Java, has been brought to a successful conclusion, the three "Flying Dutchmen," M. van der Hoop, van Weerden Poelman, and M. van den Broeke, having arrived safely at Batavia on November 24. Flying a standard commercial Fokker F.VII monoplane, fitted with a Rolls-Royce "Eagle IX" engine, they left Amsterdam on October 1. When crossing Bulgaria on October 4 they had to make a forced landing at Philippopolis and crashed the machine. This was repaired and a new engine sent out to them from Holland, and on November 2 they continued their journey. After arriving at Bangkok on November 16, as reported last week, they spent the next day preparing for the crossing of the Gulf of Siam, and resumed the flight on November 18, when they flew to Singora on the Malay Peninsula. Here they spent two days in overhauling the machine, and on November 21 they flew to Medan in the island of Sumatra. They had now reached Dutch territory, and accordingly received an enthusiastic welcome from thousands of spectators, who had come from all round to meet them, as well as an official welcome on behalf of the Governor of the Dutch East Indies. The President of the Dutch East Indies Society Air Force sent the airmen a prize of 15,000 guilders. From Medan they proceeded to Munkok the following day, and on November 24 they concluded the journey, arriving early in the afternoon at the aerodrome at Batavia. There was, of course, considerable enthusiasm, and the day was declared a national holiday. They were met by a squadron of military aeroplanes, which guided them into the aerodrome. On landing the three airmen were presented with decorations conferred on them by the Queen of Holland. They have thus covered the 15,000 odd miles in 27 days, excluding the 28 days' stay at Philippopolis.

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The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

COMMITTEE MEETING

A MEETING of the Committee was held on Wednesday, November 19, 1924, when there were present :—Lieut.-Col. F. K. McClean, A.F.C., in the Chair; Air Vice-Marshal Sir W. S. Brancker, K.C.B., Mr. Ernest C. Bucknall, Lieut.-Col. M. O. Darby, Captain D. G. Murray, Lieut.-Col. M. O'Gorman, C.B., Mr. F. Handley Page, Mr. T. O. M. Sopwith, and the Secretary.

Election of Members.—The following new Members were elected :—

Flying Officer W. G. Nicholls.
Air Commodore F. C. Halahan.
Pilot Officer T. A. Hale-Monro.
Pilot Officer G. J. Southam.
Flying Officer C. H. F. Grace.
Flying Officer R. G. R. Godby.
W. R. Ponting.
D. F. A. Apthorp.
Pilot Officer G. D. Gibson.
John N. Bamford.
Flight-Lieut. F. T. Boucher.
Flying Officer Maurice Banks.
Pilot Officer H. R. F. Baxter.
R. F. Cerrito.
Flying Officer T. B. R. Meadmore.
L. S. Marler.

Naval and Military Officers attached to R.A.F. for Service.—It was decided to admit naval and military officers attached to the Royal Air Force for service, to Membership of the Club at an annual subscription of £2 2*s*. whilst so serving.

LIGHT AEROPLANE CLUBS

COL. DARBY reported that he and the Secretary had represented the Club at a Joint Meeting of Air Ministry and delegates from the six clubs selected by the Air Ministry.

General Sir W. S. Brancker had outlined to the meeting the present position.

Practically all the machines which competed at Lympne were being subjected to further tests at Martlesham. These tests would determine whether the 1,100 c.c. engine was suitable or not for the required purpose. In the meantime the Air Ministry were not in a position to recommend any of the two-seater light aeroplanes for purchase by the clubs.

A general discussion took place as to the best method to be adopted to keep alive the interest already created in the various centres, and the Royal Aero Club supported the proposal that the Air Ministry should allow each club to employ part of the Air Ministry grant for the purchase of a two-seater dual control instructional machine to tide over the period until the Air Ministry were in a position to make definite recommendations.

It was further suggested that the Air Ministry might lend standard instructional machines to the clubs, the clubs undertaking the insurance.

As a result of these discussions each club was asked to send in to the Air Ministry its own views on the scheme.

The Air Ministry officials having withdrawn, the delegates from the various clubs had an informal meeting to consider the situation, and it was decided that in order to allow the formation of the Clubs to proceed, the Air Ministry should be definitely asked to loan standard instructional machines, the clubs on their part to undertake the insurance, or, as an alternative, allow part of the grant to be utilised for this purpose.

The question of the insurance of light aeroplanes was discussed, and the Royal Aero Club was asked to negotiate with the underwriters on behalf of all the clubs.

Report of Committees.—The following reports were received and adopted :—Racing Committee; House Committee; Joint Standing Committee.

Customs Carnet for Touring Aircraft.—It was reported that the following countries had agreed to adopt the Carnet, and that it would come into force on April 1, 1925 :—Belgium, Great Britain, France, Italy, Holland, Rumania and Switzerland.

It was agreed that the Royal Aero Club, who will issue the Carnet for British Aircraft, touring abroad, should give the necessary guarantees to all the countries which have adopted the Carnet.

Contribution to the Racing Fund.—A donation of £25 from Col. Ogilvie was reported.

Schneider Cup, 1924.—Letter was read from the National Aeronautic Association of U.S.A., dated October 31, 1924, acknowledging the Club's appreciation of the action taken in not holding the race this year.

RACING COMMITTEE.

A MEETING of the Racing Committee was held on Tuesday, November 4, 1924, when there were present :—Air Vice-Marshal Sir W. S. Brancker, K.C.B., in the Chair, Lieut-Col. W. A. Bristow, Capt. R. J. Goodman Crouch, Lieut-Col. M. O. Darby, Lord Edward A. Grosvenor, Col. F. Lindsay Lloyd, C.M.G., C.B.E., Lieut.-Col. A. Ogilvie, C.B.E., Howard T. Wright and the Secretary.

Racing Programme, 1925.—The Committee considered the draft Racing Programme for 1925, and passed it for submission to the Joint Standing Committee of the R.Ae.C. and S.B.A.C.

The programme included an Easter meeting at Hendon, the King's Cup Race, Aerial Derby, International Speed Contest, Grosvenor Challenge Cup and Air League Challenge Cup.

A certain number of races will be allocated to the light aeroplane, and apart from races, certificates of performance will be given for greatest speed, height, rate of climb and speed range.

JOINT STANDING COMMITTEE.

A Meeting of the Joint Standing Committee of the R.Ae.C. and S.B.A.C. was held on Wednesday, November 5, 1924, when there were present :—

Royal Aero Club.—Lieut.-Col. F. K. McClean, A.F.C., in the Chair, Air Vice-Marshal Sir W. S. Brancker, K.C.B., Lieut-Col. M. O. Darby, Lieut-Col. A. Ogilvie, C.B.E.

Society of British Aircraft Constructors.—C. R. Fairey, Capt. H. E. P. D. Acland, Commander James Bird, H. T. Vane.

In attendance :—C. V. Allen, Secretary, S.B.A.C.; H. E. Perrin, Secretary, R.Ae.C.

The Committee discussed various points relating to handicapping for aeroplane races and verification of machines and engines entered for races and competitions.

The racing programme, 1925, proposed by the Club, was submitted.

Offices : THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.
H. E PERRIN, Secretary.

1,000 Miles on an Avia B.H.10

A VERY good performance was recently put up on one of the Avia machines designed and built by the Czecho-Slovak firm of Milos Bondy a Spol, of Prague. On November 5 Mr. Lhota, flying an Avia B.H.10, left Prague aerodrome for Yugoslavia for the purpose of demonstrating the machine's qualities. He arrived at Novi Sad on November 8. Here the pilot put the machine through its tests, in spite of unfavourable weather conditions, including all the various stunts. Later, several Yugoslav pilots took the machine up for the first time. Mr. Lhota then flew to Belgrade, covering the 50 miles or so in 33 minutes. On the return trip to Novi Sad Lhota made 53 consecutive loops, at about 3,000 ft., for a distance of 4 miles. He returned home to Prague on November 14, having covered altogether some 1,000 miles. The Avia B.H.10 is a low-wing monoplane, with a 60 h.p. Walter engine.

"SOME FURTHER PRACTICAL POINTS IN THE STRUCTURAL DESIGN OF AIRCRAFT"

THE paper read by Dr. A. P. Thurston before the Institution of Aeronautical Engineers on November 21 was not nearly as well attended as it ought to have been. Dr. Thurston's paper was of a somewhat different character from what was to be expected from the title given in the Institution's fixture list, where the paper was announced to be headed "Graphical Methods of Aircraft Structural Design." In point of fact, Dr. Thurston did not give any new methods of graphical structural design, but confined himself to showing lantern slides of curves of aeroplane percentage weights, stability formulæ, average curves for fuselage strengths for machines of various sizes, crippling loads on struts and longerons and such-like matters. The curves of average item weights were, the lecturer admitted, based on pre-War machines, and in the discussion following the lecture Dr. Thurston was criticised for attempting to compare modern machines with those indicated in the curves. Basing his average figures on the curves for pre-War machines, the lecturer arrived at the following percentage weights: Body 17 per cent., under-carriage 4, wing structure 20, engine and installation 26, and useful load 33 per cent. of total loaded weight.

Turning to the question of longitudinal stability of aeroplanes, Dr. Thurston showed a slide in which tail plane and elevator moments were plotted against the product of wing area and chord. Drawn through the points representing a number of German machines was a straight-line curve representing Barnwell's formula, $al = 0{\cdot}4$ AC, in which a is the area of tail plane and elevators, l the distance of elevator hinges from centre of gravity of machine, A the equivalent area of main planes, and C the average chord. The lecturer stated that the constant might be somewhat less than 0·4 in certain cases. Most English machines, he said, fell either on the stable side of the curve or near the line of Barnwell's formula, while many War-time German machines fell far over on the unstable side. He then gave values of al/AC for a number of German machines, ranging from 0·0815 for the Brandenburg monoplane to 0·572 for the Albatros.

The remainder of the paper was devoted to sections dealing with the strength of fuselage with vertical loading, the strengh of fuselage with lateral loading, strength of longerons, strength of body struts and inter-plane struts, and properties of wood. Slides were shown illustrating how timber strength decreases with absorption of moisture. The lecturer also stated that the strength of woods varied as the specific gravity. An exception appeared to be oak, which appeared to have a smaller strength in proportion to its weight than other woods.

A lively discussion followed the reading of the paper. Mr. Oswald thought such average curves as those shown should be treated with respect, and personally he preferred to use fundamental equations, as there were such great variations in detail design and in the materials used. The curves of percentage weights were, he thought, unfair to light 'planes, which according to the curves would show up badly, but which in reality were very efficient. He also thought he recognised some of the curves as having been previously published in "Aircraft Engineering."

Capt. W. H. Sayers said that such average curves as those shown by the lecturer did a lot of harm and slowed up progress. Such curves of average item percentages when used by the Air Ministry had the effect of hampering design because if a designer came along with a design in which the structure weight, for instance, was much smaller than the average percentage, the Air Ministry said that the machine could not be safe with such a low weight, and the design would then probably be turned down. With reference to the Barnwell formula and the figure of 0·0815 for the Brandenburg monoplane, he did not know exactly which Brandenburg the lecturer was referring to, but if it was the Brandenburg seaplane of which examples had been obtained by this country at the end of the War, it would seem that the formula given broke down completely, because although the figure for the Brandenburg was only about one-fifth of the average value of 0·4, the Brandenburg had proved in practice to be extremely pleasant to fly and very manœuvrable. So much depended upon the wing section used that one could not use such average figures. For instance, with most of the German "tadpole" sections of the Schoukowsky type a constant of 0·4 would result in a totally uncontrollable machine.

Mr. Evans thought the formula wide of the mark, and considered it fundamentally wrong, because it was based upon chord length, and it was c.p. travel and not chord length that mattered. He asked what would, for instance, be the result of trying to apply the formula to a machine with reflex section which, being stable, required no tail. He was not even sure that the formula was right for biplanes using R.A.F. 15 section. With regard to the German machines falling on the unstable side of the curve, he thought that there again comparisons might be unfair, because the curve was based upon the use of R.A.F. 15 sections, while, as a matter of fact, the Germans used quite different sections during the War, and the tail planes might be, and probably were, quite satisfactory for the wing sections employed.

Lieut. Olechnovitch would like to ask the lecturer if he had any information concerning the use of certain fillers for wood to prevent moisture absorption and strengthen the timber. He himself had carried out some experiments in which the timber was placed in a vacuum so as to draw out all juices. The test specimen was then soaked in dope, and on test afterwards was proved to have nearly double the strength of the natural timber.

The Chairman, Mr. W. O. Manning, said he was not sure the lecturer was right in stating that the curves representing item weights referred to machines ten years' old, as there was one weighing 21,500 lbs. (Here the lecturer interposed the explanation that this machine was the Sikorsk.) He did not think that the structure weight of modern machines could be compared with that of pre-War types. He shuddered, he said, when he saw the curves showing decrease of strength with moisture absorption, but regained some of his composure when he recalled that machines had been flying for many years and shown no signs of becoming dangerously weak, so, presumably, they did not absorb as much moisture as might be thought. He would like to see experiments carried out on how absorption of oil affected the strength of timber. He thought it might be found to weaken it considerably.

In replying to his various critics, Dr. Thurston said the curves were meant to indicate a method, and were not intended as curves of reference. They were useful for checking one's own calculations. Barnwell's formula was on the safe side, and the machines designed to it were among the most successful of their period. He did not agree that average curves slowed down progress. On the contrary, he thought they should be an incentive to designers to improve upon the average results. During the War the curves had proved useful in showing that structure weight did not increase with the size at the rate certain experts claimed, and, consequently, it had been possible to start work on large machines which might otherwise not have been built. The reason why large machines did not increase in the theoretical ratio was that they were not mere geometrical copies on a larger scale, but employed different detail structural members.

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Lord Thomson's Eastern Tour

ON November 21 last Lord Thomson, Air Minister in the late Government, gave a most interesting lecture before the Central Asian Society at the Royal United Service Institution. Viscount Peel presided, and Lord Thomson's subject was "My Impressions of a Tour in Iraq." Lord Thomson began with a brief outline of the aerial tour he made last September, and most of these opening remarks—and indeed much of what followed—were, naturally, a repetition of what has already appeared in FLIGHT dealing with Lord Thomson's Eastern tour (FLIGHT, October 16, 1924), so that it will be unnecessary to repeat it here. Lord Thomson, however, dealt at greater length on the political situation in Iraq, and gave his impressions on this aspect of the case obtained during his short but comprehensive tour. Lack of space will not allow us to quote these impressions—which are not directly connected with aviation—in full, but, briefly, they may be condensed into the following salient points: The bombing expeditions of the R.A.F., though regrettable were absolutely necessary for maintaining law and order, and, in fact, actually were in the end the means of lessening the amount of suffering; Great Britain should not yet withdraw from Iraq, which required above all things, security; this security was being largely maintained by the R.A.F., which, as Lord Thomson put it, was the cement that kept the bricks together.

FLIGHT

THE ROYAL AIR FORCE

London Gazette, November 18, 1924

General Duties Branch

The following Flying Officers are granted permanent commns. in rank stated (Nov. 19) :—G. G. H. Du Boulay, H. J. Gemmel, J. T. Paine. Pilot Offr. E. B. Addison is granted a permanent commn. in that rank, with effect from June 14, 1922, and with seny. Dec. 14, 1920; Pilot Offr. E. B. Addison is promoted to rank of Flying Officer; June 14, 1922 (substituted for *Gazette* Feb. 6, 1923).

The following Pilot Officers are promoted to rank of Flying Officer :—H. C. E. C. P. Dalrymple; April 2. A. H. Grace; July 13. J. C. Hill; Aug. 10. R. A. A. Cole; Nov. 15. Flying Offr. R. Stiven is granted the hon. rank of Flight-Lieutenant; Oct. 29.

The following Squadron-Leaders are placed on half-pay, Scale B :—Lieut. M. Bailey, A.F.C.; Nov. 15 to 25, inclusive. F. W. Stent, M.C.; Nov. 20 to 25, inclusive. Sqdn.-Ldr. P. R. Burchall, O.B.E., is placed on retired list; Nov. 15.

The following are transferred to Reserve, Class A :—*Flight-Lieuts.*—H. S. Shield, M.C.; Nov. 19. J. F. Stallard; Nov. 17. *Flying Officer.*—A. F. Wynne; Nov. 15.

Flying Offr. C. B. Bond resigns his short service commn.; Nov. 19. Flying Offr. (hon. Flight-Lieut.) A. J. Carlielle (Capt., R.A.S.C.) relinquishes his temp. commn. on return to Army duty; Nov. 14.

Stores Branch

The following Flying Officers are granted permanent commns. in rank stated :—N. W. Law, H. J. Young, M.B.E.; Nov. 19. Flight-Lieut. J. R. Nicholls is placed on retd. list on account of ill-health; Nov. 19. The following are granted permanent commns. for accountant duties as Pilot Officers on probation :—C. E. Aston, H. J. Titherington, K. E. M. Holmes, J. M. Murray, C. F. Goatcher, C. Lorimer, E. Smith; Nov. 10.

Chaplains' Branch

The Rev. F. G. B. Sutherland is granted a short service commn., with relative rank of Squadron-Leader; Nov. 10.

Reserve of Air Force Officers

The following are granted commns. on probation in General Duties Branch, in ranks stated (Nov. 18) :—

Class A.—Pilot Officers.—R. J. Bunning, R. A. Whitehead.

Class B.—Flying Officer.—C. G. Bloomer.

The following Pilot Officers are promoted to rank of Flying Officer :—R. F. Cathrow; Oct. 21. L. Motley, D. L. H. Williams, A. V. Blunt, J. G. Butt, C. H. H. Downing, G. H. E. Roxburgh; Nov. 18. The following Pilot Officers are confirmed in rank, with effect from dates indicated :—C. F. D. Evans; Oct. 18. J. J. Scholes, W. E. Taylor; Nov. 13. Flying Offr. J. A. H. Savage is transferred from Class B to Class C; Oct. 23. Pilot Offr. C. O. Hinks is transferred from Class A to Class C; Nov. 18. Flying Offr. E. Jackson relinquishes his commn. on account of ill-health, and is permitted to retain his rank; Nov. 19. Pilot Offr. R. H. Leavey relinquishes his commn. on account of ill-health; Nov. 19.

Memoranda

Flying Offr. A. H. Richter relinquishes his hon. commn. on ceasing to be employed; Oct. 7.

Erratum (FLIGHT, Oct. 30, 1924, p. 701): *Gazette* Oct. 21, 1924.—For G. T. Whitcombe read G. T. Witcombe.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified :—

General Duties Branch.

Wing Commanders :—G. C. St. P. de Dombasle, O.B.E., to R.A.F. Depot, pending disposal on transfer to Home Estab. 18.10.24. W. H. Primrose, D.F.C., to H.Q., Iraq, for Air Staff (Armoured Car) duties. 1.11.24.

Squadron Leaders :—A. H. Measures, O.B.E., to R.A.F. Depot (Non-effective Pool), on transfer to Home Estab. 18.10.24. A. Levick, O.B.E., and A. T. Harris, A.F.C., to R.A.F. Depot, on transfer to Home Estab. 18.10.24. F. E. Sandford, A.F.C., to No. 4 Flying Training Sch., Egypt. 9.11.24. W. H. de W. Waller, A.F.C., to Heliopolis Details, Egypt. 1.12.24. T. F. Bullen, O.B.E., to R.A.F. Depot, on transfer to home Estab. 1.11.24.

Flight Lieutenants :—H. G. Bowen, M.B.E., W. E. C. B. C. Forsyth and H. I. T. Beardsworth, to R.A.F. Depot, on transfer to Home Estab. 18.10.24. L. O. Brown, D.S.C., A.F.C., to No. 24 Sqdn., Kenley, on transfer to Home Estab. 18.10.24. A. Durston, A.F.C., to R.A.F. Depot, on transfer to Home Estab. 5.11.24. J. A. Slater, M.C., D.F.C., to R.A.F. Depot (Non-effective Pool), on transfer to Home Estab. 18.10.24. A. J. G. Styran, M.C., A.F.C., to Armament and Gunnery Sch., Eastchurch. 1.12.24. R. B. Mansell, O.B.E., H. W. Woollett, D.S.O., M.C., J. W. Jones, A. L. Paxton, D.F.C., and J. Whitford, to R.A.F. Depot, on transfer to Home Estab. 1.11.24. R. Jope-Slade, D.S.C., B. J. W. Brady, D.S.M., and W. L. Fenwick, to H.Q., Iraq. 1.11.24. M. D. Nares, A.F.C., to R.A.F. Depot, on transfer to Home Estab. 5.10.24.

Flying Officers :—C. A. C. Fidler, D.C.M., to No. 1 Stores Depot, Kidbrooke, on transfer to Home Estab. 18.10.24. R. W. F. Dunning, W. F. A. Preston, and G. E. F. Boyes, to Armament and Gunnery Sch., Eastchurch. 1.12.24. E. H. M. David, C. P. Wingfield, J. G. Shackleton and T. J. Desmond, to R.A.F. Depot (Non-effective Pool), on transfer to Home Estab. 18.10.24. H. S. C. Bassett, to No. 24 Sqdn., Kenley. 17.11.24. C. W. Usher, to No. 24 Sqdn., Kenley, on transfer to Home Estab. 18.10.24. G. R. Stafford, to No. 1 Sch. of Tech. Training (Boys), Halton, on transfer to Home Estab. 18.10.24. W. F. Shaylor, V. Croome, G. Thornton-Norris, W. N. Sherlock, P. R. Cawdell, G. H. Smith, H. A. C. Atkinson and D. M. N. Coles, to R.A.F. Depot, on transfer to Home Estab. 18.10.24. J. T. Hall, to R.A.F. Depot on transfer to Home Estab. 21.10.24. W. J. Brown, E. C. Usher and W. H. Phillips, to No. 481 Flight Mediterranean. 11.11.24. J. L. Miles to remain at No. 39 Sqdn., Spittlegate, instead of to No. 1 Flying Training Sch., as previously notified. H. W. Westaway, D. S. Allan, B. A. C. Russell, N. V. Moreton, J. V. Roberts and R. G. R. Godby, to R.A.F. Depot, on transfer to Home Estab. 21.10.24. R. L. B. Rose, to No. 24 Sqdn., Kenley. 17.11.24. J. D. S. Denholm, L. H. Stewart and R. H. S. Mealing, to H.Q., Iraq. 1.11.24. W. Anderson to Aircraft Depot, Egypt. 1.11.24. R. S. Walter, R. V. D. White and A. L. Harris, to R.A.F. Depot, on transfer to Home Estab. 5.10.24. F. K. Damant, D.F.C., F. T. Jacobs, W. Morgan, J. P. Hinks and H. J. Toye, to R.A.F. Depot, on transfer to Home Estab. 1.11.24. C. F. Sealy, to Armament and Gunnery Sch., Eastchurch. 13.11.24. P. H. Hunter, to R.A.F. Base, Gosport. 12.11.24. S. H. Reynolds, to R.A.F. Base, Calshot. 12.11.24. N. M. Ffrench, to No. 32 Sqdn., Kenley. 19.11.24.

Pilot Officers :—M. Russell to R.A.F. Depot, on transfer to Home Estab. 1.11.24. H. E. N. Burton, to No. 2 Flying Training Sch., Digby. 11.11.24. F. W. C. G. Tussaud, to No. 99 Sqdn., Bircham Newton. 25.11.24. G. H. Loughman, to No. 24 Sqdn., Kenley, on appointment to a Permanent Commn. from Cadet College. 31.10.24.

Stores Branch.

Wing Commander C. G. Smith, O.B.E., to H.Q., Iraq, for Stores Staff duties. 14.11.24.

Squadron Leader B. W. M. Williams, to No. 4 Stores Depot, Ruislip, on transfer to Home Estab. 18.10.24.

Flying Officer C. J. Elliott, to H.Q., Cranwell. 21.11.24.

Accountant Branch.

Squadron Leader R. Whyte, to Inland Area Aircraft Depot, Henlow. 24.11.24.

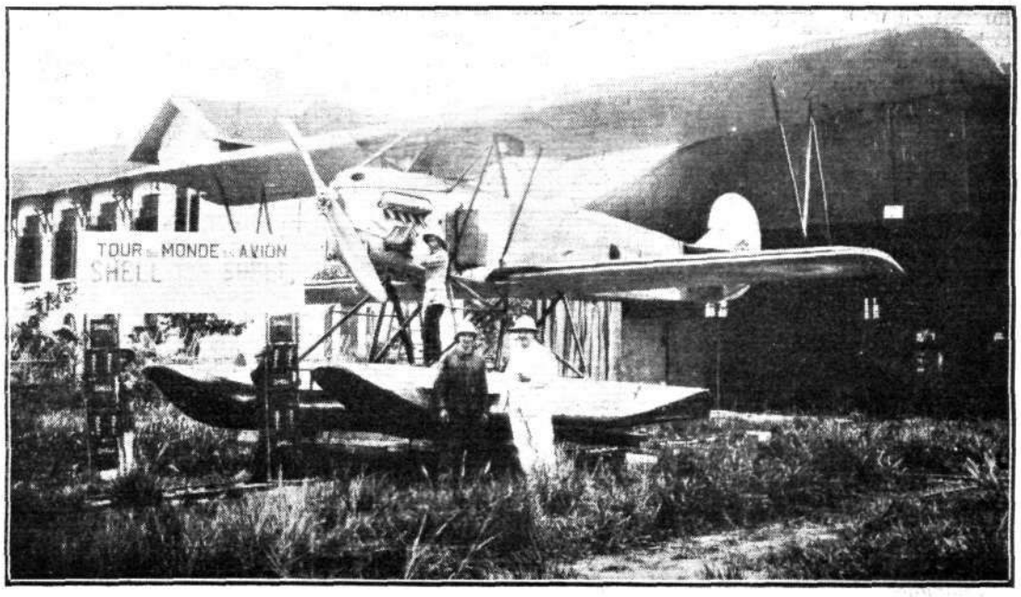
Flight Lieutenant J. Sullivan, to Command Accounts Office, Palestine. 15.10.24.

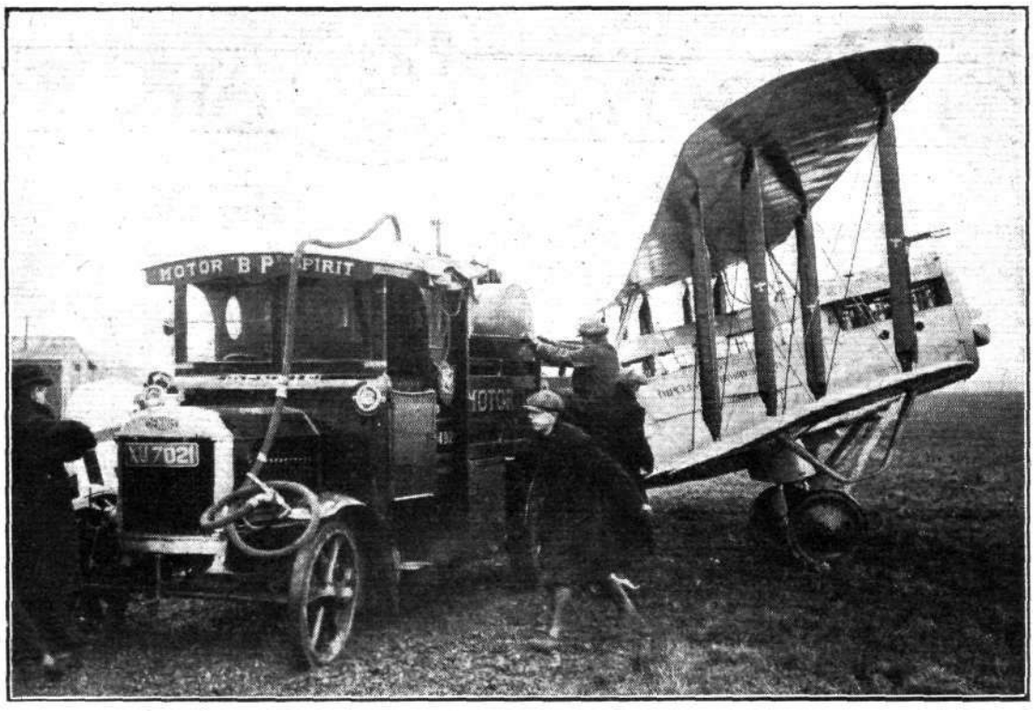
Flying Officer C. G. Prior, to No. 55 Sqdn., Iraq. 9.10.24.

Medical Branch.

Flight Lieutenant T. P. Harpur, to R.A.F. Depot. 12.11.24.

Maj. Zani's World Flight: Maj. Zani, the Argentine airman, who has been attempting a round-the-world flight on a Fokker biplane fitted with a Napier "Lion" engine, has, after reaching Tokio, postponed the flight owing to the lateness of the season. The annexed photograph shows the seaplane model, at Haiphong, being refuelled with "Shell," which Maj. Zani said he "considered to be the best which I have ever used throughout the whole of my career as an aviator. By its unvarying quality it permits one to obtain from the engine the maximum power without imposing any strain."





THE FLIGHT TO INDIA : On November 20 Air Vice-Marshal Sir Sefton Brancker, Director of Civil Aviation, started on his flight to India (particulars of which were given in last week's issue of "Flight") on a D.H.50 biplane (Siddeley "Puma") piloted by Alan Cobham. The accompanying photograph shows the "50" being filled with "B.P." fuel prior to the departure from Stag Lane Aerodrome. Incidentally, "B.P." originates from the Persian Oil Fields, one of the countries to be traversed in the course of the flight, so here, perhaps, is a modern version of "taking coals to Newcastle."

The Late Air Commodore E. M. Maitland's Aeronautical Collection for Sale

WE would draw our readers' attention to the announcement appearing in our advertisement columns in respect to the sale by auction on December 11 next, at Messrs. Hodgson and Company's Rooms (115, Chancery Lane, W.C. 2) of an important aeronautical collection. The late Air Commodore E. M. Maitland was, as those of our readers who knew him intimately are aware, an enthusiastic student of early aeronautical history, and had formed an extremely interesting collection of aeronautical engravings and books dealing with this subject—some of which are very rare. It is this valuable collection which is to be disposed of at the sale referred to above, and those of our readers who are interested in this matter should obtain particulars of the various items from Messrs. Hodgson. It may be mentioned that besides the engravings and books mentioned above, there are included many other interesting items, such as aeronautical objects d'art, photographs of modern aircraft, MS. copies of the Log of "H.M.A. R.34," and an autograph copy of Kipling's "Actions and Reactions," etc.

The Aircraft Operating Co's. Activities

THE Aircraft Operating Company has decided to increase its activities, and for this purpose the capital is being increased. The Company will be primarily concerned with the operation of aircraft, aerial surveys and air transport services. It is also going to develop a consulting and engineering side, and for this purpose it has engaged the services of Major Mayo, O.B.E., M.A., Assoc.M.Inst.C.E., F.R.Ae.S., who was a director of Ogilvie and Partners, but who has now joined the Aircraft Operating Company as a director. For the present the administrative offices will be at 8, New Square, Lincoln's Inn, W.C. 2. We would take this opportunity of pointing out that the above company is in no way connected with the De Havilland Company, although Mr. Alan S. Butler happens to be Chairman of both companies.

De Havilland Aircraft

ALTHOUGH one of the youngest of our aircraft firms—that is, a product of the War—the De Havilland Aircraft Company, of Stag Lane Aerodrome, Edgware, has built up a reputation for the various types of aircraft bearing the name D.H. that places it in the front rank in practically every country in the world where aircraft are employed. During the past ten years or so, this company and its "parent" companies have produced machines of practically every type, which have been developed as time went on, until today there is a family of "D.H.'s" suitable for almost every class of aerial work—civil and military—which still retains its world-wide reputation for first-class performance. The De Havilland Company have just issued an interesting illustrated catalogue giving brief particulars of all these types, and anyone interested in aerial transport, etc., should certainly apply for one of these catalogues.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor
The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1923

Published November 27, 1924

19,126. G. NEWMAN. Main plane incidence control. (223,966.)
19,222. GLOUCESTERSHIRE AIRCRAFT CO., LTD., H. P. FOLLAND and H. E. PRESTON. Metal spars for aircraft. (223,971.)
19,823. H. LEITNER. Screw propellers. (223,992.)
27,921. J. C. SAVAGE. Production of advertising-signs of smoke in the air. (224,087.)
29,670. L. and P. BREGUET. Wire-drawing machines. (224,099.)

APPLIED FOR IN 1924

Published November 27, 1924

5,583. A. ROHRBACH. Means for connecting rudders, etc., to aircraft (212,557.)

FLIGHT

The Aircraft Engineer and Airships

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